

Section VIII. Implementation

8.01 Best Management Practices

As a rule of thumb, Conservation Plans will be developed for individual sites as properties are enrolled into BCWP programs. Because each site is unique, each mix of BMPs will be unique to that location.

The following BMPs have been organized according to land use (NPS source) and correlated to the Objectives and Tasks outlined in *Section VII Watershed Management Goals & Indicators*
Watershed Management Goals & Indicators

(a) Abandoned Mine Lands

Table VIII-1 – Abandoned Mine Lands

Best Management Practices applied to Abandoned Mine Lands (AML) are directed by agencies regulating and funding their restoration: the Indiana Department of Natural Resources – Division of Reclamation and the Federal Department of the Interior – Office of Surface Mining. BMPs implemented are dependent upon individual site topography, hazards, pollutants, etc. These BMPs include:

- Mine Shaft and Adit Closings
- Ditches to divert surface water from mine waste, tailings or mine works.
- Removal and consolidation of small waste piles.
- Removal of large waste piles from water sources.
- Relocation of stream from waste rock dump or tailings pile
- Regrading to control erosion followed by revegetation
- Capping waste rock piles or tailings with uncontaminated soils followed by revegetation.
- Aeration and settling ponds to promote precipitation of metals from mine drainage.
- Sulfate-reducing wetlands
- Oxidation wetlands
- Passive Acid Mine Drainage treatment facilities
- Active Acid Mine Drainage treatment facilities

(b) Active Mineral Extraction

Table VIII-2 – Active Mineral Extraction

Active mining and drilling operations are permitted and regulated through various agencies, including Indiana Department of Environmental Management, Indiana Department of Natural Resources, United States Army Corps of Engineers, and United States Department of the Interior – Office of Surface Mining. In most cases, BMPs are part of permitting requirements, and overseen by these agencies. Additional BMPs that may be implemented include:

- Grading / revegetation of well-pads to reduce visual and erosive impact.
- Agricultural BMPs to improve soil structure and fertility while reducing erosion
 - Cover Crops – to build soil structure, biomass, and significantly reduce erosion.
 - Compaction Avoidance Techniques
 - Controlled Traffic Zones (no earlier than year 5, maybe later)
 - Conservation Crop Rotation – especially those that include long-term crops such as clover and alfalfa.
 - Contour Farming
 - No-till / Conservation Tillage. It is important to note that some tillage may be required in the initial years of production to address settling issues and resulting erosion potential.
 - Regrading – Especially important in the initial years of production to address settling issues and resulting erosion potential
 - Soil Testing and Variable Rate Applications of Nutrients. Because of changes to soil structure, it may be more effective to use electrical conductivity-based systems (such as Soil Doctor and VERIS) rather than traditional 2.5 acre grid samples.
 - Use of animal manures / compost to promote rebuilding of soil structure and organic matter.
 - Terraces

- WASCoBs
 - Grassed Waterways
 - Filter Strips / Buffers
- Conservation BMPs. Those practices required through permitting may be augmented after bond release.
 - Nutrient / Sediment trapping wetlands
 - Two-stage ditches / Drainage water management
 - Field Buffers
 - Wildlife Habitat protection and management

(c) Agricultural BMPs

Table VIII-3 – Commodity and Horticultural Crops and Table VIII-4 - Livestock

Agricultural BMPs may be subdivided by agronomic / cropping BMPs and livestock practices. Riparian area protection BMPs may be found in Section 8.02h. The basis for most of the BMP standards can be found in the NRCS Field Office Technical Guide (FOTG).

- Agronomic / Cropping BMPs
 - Contour Farming / Alley Cropping
 - Cover Crops
 - Crop Rotation
 - Drainage Water Management
 - Grassed Waterways / Ephemeral Stream Protection
 - Irrigation System Management
 - Integrated Pest Management
 - Mulching / Residue Management
 - No-Till
 - Nutrient and Sediment – trapping Wetlands
 - Precision Agriculture Technology
 - Soil & Tissue Sampling
 - Variable Rate Application of Nutrients and Lime.
 - Guidance Systems
 - Autoswath Systems
 - Stream Crossing
 - WASCoBs
 - Terraces
 - Windbreak - Shelterbelts
- Livestock BMPs
 - Access Control / Use Exclusion (may include watering facility)
 - Anaerobic Digester
 - Animal Mortality Facility
 - Composting Facility
 - Grass and Hayland Plantings
 - Grazing Management / Rotational Grazing
 - Heavy Use Area Protection
 - Stream Crossing
 - Waste Storage Facility

(d) Logging / Land Clearing

Table VIII-6 – Forested and Upland

Logging and land clearing do not go hand in hand. Although Logging operations may include some clear cutting to improve future timber stands, it should be noted that logging operations do not include grubbing / stump removal or clearing for other land uses. The one exception could be logging operations followed by land clearing for surface mining operations.

- Logging
 - Certified Forestry Program
 - Filter Strips / Buffers
 - Forest Stand Improvement

- Successional Forestry Cropping (Interplanting of niche crops with long-term crops such as walnut)
 - Harvesting Plan
 - Stream Crossing
 - Tree & Shrub Establishment
- Land Clearing
 - Education / Outreach
 - Riparian Area Protection / Restoration

(e) Lawn / Landscaping

- Education and Outreach
- Filter Strips
- Integrated Pest Management

(f) Municipal Infrastructure

- Gravel Road Construction / Maintenance
- Ditch Construction / Maintenance
- Rain Gardens / Gutter Disconnect
- Stormwater Wetlands
- Two-stage Ditches

(g) Private Waste Disposal

- Septic System Inspection and Maintenance
- Alternative septic systems
- Household waste removal
- Amnesty Days
- Region-wide trash removal

(h) Riparian Area Protection

Table VIII-5 – Streams and Wetlands

- Mitigation Clearinghouse
- Ephemeral Stream / Headwater Restoration / Preservation
- Filter Strips / Buffers (Including Habitat Development)
- Forested Riparian Area
- Stream Restoration / Preservation
- Streambank Stabilization
- Stream Crossings
- Wetland Restoration / Preservation

8.02 Programs

A large number of programs are available as funding sources for the variety of BMPs listed in Section 8.02. The following matrices are designed to assist those developing conservation plans or enrolling properties into BCWP programs.

Table VIII-1 – Abandoned Mine Lands

Practices for Abandoned Mine Lands															
	"Grade"	Concern	Algal Blooms	Aquatic Habitat	Fecal Coliforms	Pesticide Run-off	Nutrient Run-off	Metal Content	Sedimentation	Stormwater	Turbidity	Water Temperature	Wildlife Habitat	Program	BCWP
Best Management Practice															
Land Reclamation, Landslide Treatment (NRCS 453)	7			○				●	○		●		○		□
Land Reclamation, Toxic Discharge Control (NRCS 455)	5			○				●	○	○					□
Land Reconstruction, Abandoned Mined Land (NRCS 543)	7			○					●	●	●		○		□
Mine Shaft and Adit Closing (NRCS 457)	1							○							□
Diversion Ditches (C-DMG)	4			○				●		▲			○		□
Mine Waste Rock / Tailings Removal & Consolidation (C-DMG)	4			○				●					○		□
Stream Diversion (C-DMG)	3			○				●		▲					□
Erosion Control by Regrading (C-DMG)	9			○				○	●	●	●		○		□
Capping (C-DMG)	9			○				○	●	●	●		○		□
Vegetation (C-DMG)	9			○				○	●	●	●		○		□
Aeration & Settling Ponds (C-DMG)	9			○				●	●	●	●		○		□
Sulfate Reducing Wetlands (C-DMG)	9			○				●	●	●	●		○		□
Oxidation Wetlands (C-DMG)	9			○				●	●	●	●		○		□
BMPs to treat Acid Mine Drainage (C-DMG)	9			○				●	●	●	●		○		□

Direct Affect ●

Probable Affect ○

Negative Affect ▲

Stand-alone Practice ■

Part of Program or Other Requirements □

Table VIII-2 – Active Mineral Extraction

		Practices for Active Mineral Extraction - Reclaimed Farmland																						
		Concern	Algal Blooms	Aquatic Habitat	Fecal Coliforms	Pesticide Run-off	Nutrient Run-off	Metal Content	Sedimentation	Stormwater	Turbidity	Water Temperature	Wildlife Habitat	Program	BCWP	American Farmland Trust	I-DNR - Fish & Wildlife	I-DNR - Lake and River Enhancement	I-DNR - Division of Reclamation	NRCS - CRP	NRCS - EQIP	NRCS - WHIP	Conservation Organizations (OU, DU, Soil & Water Conservation District	
Best Management Practice																								
Topography and Soil Erosion (Guidebook)																								
Compaction Avoidance Techniques				○		○	○		○	●	○													
Conservation Crop Rotation (328) especially long term such as alfalfa to build organic matter	12	○	○		●	○	○	●	○	○			●								■			
Contour Farming (330)	11	●			○	●	○	●	○	●														
Controlled Traffic Zones (no earlier than yr 5 - maybe later)			○		○	○			○	●	○													
Cover Crop (340)	11	○	○		○	○	○	●	○	●			○								■			
Land Smoothing (466) to compensate for uneven settling	4	○	▲		○	○				●	○		▲					□						
Residue & Tillage Management, Mulch Till (345)	9	○	○		●	○	○	○			○		○								□			
Residue & Tillage Management, No-Till/Strip Till (329)	12	○	○		●	○	○	●	○	●			○			■					□			
Residue & Tillage Management, Ridge Till (346)	10	○	○		●	○	○	○	○	○			○											
Residue Management, Seasonal (344)	11	○	○		○	○	○	○	○	○			○											
Riparian Forest Buffer (391)	19	●	●		●	●	○	●	●	●	●	●	●					□	■	■	■			
Riparian Herbaceous Cover (390)	17	●	●		○	●	○	●	●	●	○		●					□	□	■	■			
Ripping - to be done with great caution																								
Terrace (600)	10	○			●	○	○	○	●	●														
Water & Sediment Control Basin (638)	8	○			○	○	○	●	○	●	▲										□			
Water Management (Guidebook)																								
Contour Farming (330)	11	●			○	●	○	●	○	●														
Cover Crop (340)	11	○	○		○	○	○	●	○	●			○								■			
Filter Strip (393)	15	●	●		●	●	●	●		●			○							■	■			
Grassed Waterway (412)	10	○	○		○	○	○	○	●	○			○							■				
Residue & Tillage Management, Mulch Till (345)	9	○	○		●	○	○	○			○		○								□			
Residue & Tillage Management, No-Till/Strip Till (329)	12	○	○		●	○	○	●	○	●			○			■					□			
Residue & Tillage Management, Ridge Till (346)	10	○	○		●	○	○	○	○	○			○											
Residue Management, Seasonal (344)	11	○	○		○	○	○	○	○	○			○											
Terrace (600)	10	○			●	○	○	○	●	●														
Water & Sediment Control Basin (638)	8	○			○	○	○	●	○	●	▲										□			
Crop Management (Guidebook)																								
Conservation Crop Rotation (328) especially long term such as alfalfa to build organic matter	12	○	○		●	○	○	●	○	○			●								■			
Cover Crop (340)	11	○	○		○	○	○	●	○	●			○								■			
Drought-tolerant Hybrids																								
High-residue Hybrids					○	○		○	○	○														
Nutrient Management (590)	7	●	○			●	●									■					■			
Residue & Tillage Management, Mulch Till (345)	9	○	○		●	○	○	○			○		○								□			
Residue & Tillage Management, No-Till/Strip Till (329)	12	○	○		●	○	○	●	○	●			○			■					□			
Residue & Tillage Management, Ridge Till (346)	10	○	○		●	○	○	○	○	○			○											
Residue Management, Seasonal (344)	11	○	○		○	○	○	○	○	○			○											
Animal Waste as Fertilizer			○	▲																				
Foliar Testing, including micronutrients		●	○			●																		
Soil Testing, including micronutrients		●	○			●																		
Variable Rate Applications of Nutrients & Lime																								
Site Specific Tillage (first few years)																								
Split applications of Nitrogen		●	○			●	●									■					■			
Reduced Plant Populations			○						○	○	○													
Pest Management (595)	7		●		●				○				●								■	■		

Practices for Active Mineral Extraction - Reclaimed Farmland																								
	Concern	Algal Blooms	Aquatic Habitat	Fecal Coliforms	Pesticide Run-off	Nutrient Run-off	Metal Content	Sedimentation	Stormwater	Turbidity	Water Temperature	Wildlife Habitat	Program	BCWP	American Farmland Trust	I-DNR - Fish & Wildlife	I-DNR - Lake and River Enhancement	I-DNR - Division of Reclamation	NRCS - CRP	NRCS - EQIP	NRCS - WHIP	Conservation Organizations (OU, DU, Soil & Water Conservation District		
Best Management Practice																								
Other BMPs																								
Constructed Wetland (656)	18	●	●	●	○	●	○	●	●	●		●				□	□				■	□		
Cross Wind Trap Strips (589C)	9	○	○		○	○	○	●		○		○												
Early Successional Habitat Development (647)	3		●								▲	●				□			■	■	■	□		
Field Border (386)	10	○	○		○	○	○	○	○	○		●				□			■	■	■	□		
Hedgerow Planting (422)	7	○	○		○	○					○	●				□				■		□		
Riparian Forest Buffer (391)	19	●	●		●	●	○	●	●	●	●	●					□	■	■	■	■			
Riparian Herbaceous Cover (390)	17	●	●		○	●	○	●	●	●	○	●					□	□	■	■	■	□		
Tree & Shrub Establishment (612)	15	○	●		●	○	○		○	●	○	●				□		■	□	□	■			
Upland Wildlife Habitat Management (645)	8		●					○	●	○		●				□			■	■	■	□		
Windbreak - Shelterbelt Establishment (380)	11	○	●		○	○	○	○	○	○		●				□		■	■	■	■	□		
Direct Affect	●	Stand-alone Practice												■										
Probable Affect	○	Part of Program or Other Requirements												□										
Negative Affect	▲																							

Table VIII-3 – Commodity and Horticultural Crops

Practices for Agricultural Lands - Commodity & Horticultural Crops																					
	Concern	Algal Blooms	Aquatic Habitat	Fecal Coliforms	Pesticide Run-off	Nutrient Run-off	Metal Content	Sedimentation	Stormwater	Turbidity	Water Temperature	Wildlife Habitat	Program	BCWP	American Farmland Trust	I-DNR - Fish & Wildlife	I-DNR - Lake and River Enhancement	NRCS - CRP	NRCS - EQIP	NRCS - WHIP	Conservation Organizations (QU, DU, Soil & Water Conservation District
Best Management Practice																					
Erosion																					
Alley Cropping (311)	8	○	○		○	○		○	○	○		○									
Contour Buffer Strip (332)	14	●	○		○	●	●	●	○	●		○									
Contour Farming (330)	11	●			○	●	○	●	○	●							□				
Cover Crop (340)	11	○	○		○	○	○	●	○	●		○					□		■		
Conservation Crop Rotation (328)	12	○	○		●	○	○	●	○	○		●							■		
Constructed Wetland (656)	18	●	●	●	○	●	○	●	●	●		●					□				
Cross Wind Trap Strips (589C)	9	○	○		○	○	○	●		○		○									
Field Border (386)	10	○	○		○	○	○	○	○	○		●				□			■	■	□
Filter Strip (393)	15	●	●		●	●	●	●		●		○					□	■	■		
Grassed Waterway (412)	10	○	○		○	○	○	○	●	○		○					□	■			
Hedgerow Planting (422)	7	○	○		○	○					○	●				□				■	
Mulching (484)	7	○	○		○	○	○	○	○	○							□		□		
Pasture and Hayland Planting (512)	10	○	○		○	○	○	○	○	○		●							■		
Residue & Tillage Management, Mulch Till (345)	9	○	○		●	○	○	○		○		○					□		□		
Residue & Tillage Management, No-Till/Strip Till (329)	12	○	○		●	○	○	●	○	●		○			■	■	□		□		
Residue & Tillage Management, Ridge Till (346)	10	○	○		●	○	○	○	○	○		○									
Residue Management, Seasonal (344)	11	○	○		○	○	○	○	○	○		○					□				
Riparian Forest Buffer (391)	19	●	●		●	●	○	●	●	●	●	●				□	□	■	■	■	□
Riparian Herbaceous Cover (390)	17	●	●		○	●	○	●	●	●	○	●				□	□	□	■	■	□
Sediment Basin (350)	11	●	○		○	●	○	●	○	●		▲							□		
Stream Channel Stabilization (584)	5		○					○		○	○	○					□				
Stream Crossing (578)	-1	▲		▲		▲		○		○							□		■		
Stripcropping (585)	14	●	○		○	●	●	●	○	●		○									
Terrace (600)	10	○			●	○	○	○	●	●											
Water & Sediment Control Basin (638)	8	○			○	○	○	●	○	●	▲								□		
Windbreak - Shelterbelt Establishment (380)	11	○	●		○	○	○	○	○	○		●				□		■	■	■	□
Windbreak - Shelterbelt Renovation (650)		●	●		○	●	○	○	○	○		●									
Irrigation & Drainage																					
Constructed Wetland (656)	18	●	●	●	○	●	○	●	●	●		●					□				
Drainage Water Management (554)	6	○	○		○	○	○		○		▲	○					□		■		
Filter Strip (393)	15	●	●		●	●	●	●		●		○					□	■	■		
Grassed Waterway (412)	10	○	○		○	○	○	○	●	○		○					□	■			
Irrigation or Regulating Reservoir (552)		○			○	○		○	○												
Irrigation System, Micro-Irrigation (441)	9	●			●	●	○	●											□		
Irrigation System, Sprinkler (442)	6	○			○	○	○	●											□		
Irrigation Water Management (449)	10	○			●	○	●	●		●									□		
Riparian Forest Buffer (391)	19	●	●		●	●	○	●	●	●	●	●				□	□	■	■	■	□
Riparian Herbaceous Cover (390)	17	●	●		○	●	○	●	●	●	○	●				□	□	□	■	■	□
Sediment Basin (350)	11	●	○		○	●	○	●	○	●		▲							□		
Structure for Water Control (587)	4							○	○	○	○								□		
Subsurface Drain (606)	0	▲				▲		○		○									□		
Underground Outlet (620)	4					○		○	●										□		
Water & Sediment Control Basin (638)	8	○			○	○	○	●	○	●	▲								□		

Practices for Agricultural Lands - Commodity & Horticultural Crops																					
	Concern	Algal Blooms	Aquatic Habitat	Fecal Coliforms	Pesticide Run-off	Nutrient Run-off	Metal Content	Sedimentation	Stormwater	Turbidity	Water Temperature	Wildlife Habitat	Program	BCWP	American Farmland Trust	I-DNR - Fish & Wildlife	I-DNR - Lake and River Enhancement	NRCS - CRP	NRCS - EQIP	NRCS - WHIP	Conservation Organizations (QU, DU, Soil & Water Conservation District)
Best Management Practice																					
Nutrient Management																					
Alley Cropping (311)	8	○	○		○	○		○	○	○		○									
Constructed Wetland (656)	18	●	●	●	○	●	○	●	●	●		●				□					
Drainage Water Management (554)	6	○	○		○	○	○		○		▲	○							■		
Forage Harvest Management (511)	9	○	○		○	○	○	○	○	○		○									
Nutrient Management (590)	7	●	○			●	●								■		□		■		
Riparian Forest Buffer (391)	19	●	●		●	●	○	●	●	●	●	●				□	□	■	■	■	□
Riparian Herbaceous Cover (390)	17	●	●		○	●	○	●	●	●	○	●				□	□	□	■	■	□
Structure for Water Control (587)	4							○	○	○	○								□		
Underground Outlet (620)	4					○		○	●										□		
Soil Testing		●	○			●	●								■		□		■		
Variable Rate Applications of Nutrients & Lime		●	○			●	●								■		□		■		
Pest Management																					
Alley Cropping (311)	8	○	○		○	○		○	○	○		○									
Agrichemical Handling Facility (309)	3	○	○		○	○			▲												
Forage Harvest Management (511)	9	○	○		○	○	○	○	○	○		○									
Pest Management (595)	7		●		●			○				●				□			■	■	
Prescribed Burning (338)	7	○	○			○		○	○	○		●									□
Stripcropping (585)	14	●	○		○	●	●	●	○	●		○									

Practices for Agricultural Lands - Commodity & Horticultural Crops																						
	Concern	Algal Blooms	Aquatic Habitat	Fecal Coliforms	Pesticide Run-off	Nutrient Run-off	Metal Content	Sedimentation	Stormwater	Turbidity	Water Temperature	Wildlife Habitat	Program	BCWP	American Farmland Trust	I-DNR - Fish & Wildlife	I-DNR - Lake and River Enhancement	NRCS - CRP	NRCS - EQIP	NRCS - WHIP	Conservation Organizations (QU, DU, Soil & Water Conservation District)	
Best Management Practice																						
Sensitive or Marginally Productive Areas																						
Conservation Cover (327)	13	○	○		●	○	○	●	○	●		●				□		□			□	
Constructed Wetland (656)	18	●	●	●	○	●	○	●	●	●		●					□					
Critical Area Planting (342)	9	○	○			○	○	●		●		○				□			■		□	
Cross Wind Trap Strips (589C)	9	○	○		○	○	○	●		○		○										
Drainage Water Management (554)	6	○	○		○	○	○		○		▲	○							■			
Early Successional Habitat Development (647)	3		●								▲	●				□			■	■	□	
Field Border (386)	10	○	○		○	○	○	○	○	○		●				□			■	■	□	
Filter Strip (393)	15	●	●		●	●	●	●		●		○					□	■	■			
Grassed Waterway (412)	10	○	○		○	○	○	○	●	○		○					□	■				
Prescribed Burning (338)	7	○	○			○		○	○	○		●										
Restoration & Management of Declining Habitat (643)	6		●								○	●				□			■	■	□	
Riparian Forest Buffer (391)	19	●	●		●	●	○	●	●	●	●	●				□	□	■	■	■	□	
Riparian Herbaceous Cover (390)	17	●	●		○	●	○	●	●	●	○	●				□	□	□	■	■	□	
Shallow Water Development & Management (646)	11	○	●			○	○	○	●	○		●				□		■	■	■	□	
Stream Channel Stabilization (584)	5		○					○		○	○	○					□					
Stream Crossing (578)	-1	▲		▲		▲		○		○									■			
Stream Habitat Improvement & Management (395)	8		●							●	●	●					□					
Streambank & Shoreline Protection	9	○	○			○		●		●	○	○					□					
Tree & Shrub Establishment (612)	15	○	●		●	○	○		○	●	○	●				□		■	□	□	□	
Upland Wildlife Habitat Management (645)	8		●					○	●	○		●				□			■	■	□	
Wetland Creation (658)	14	●	●		○	●	○	○	●	○		●						□		■	□	
Wetland Enhancement (659)	14	●	●		○	●	○	○	●	○		●				□				■	□	
Wetland Restoration (657)	14	●	●		○	●	○	○	●	○		●				□	□	■	■	■	□	
Wetland Wildlife Habitat Management (644)	8		●						●	●		●				□			■	■		
Windbreak - Shelterbelt Establishment (380)	11	○	●		○	○	○	○	○	○		●				□		■	■	■		
Windbreak - Shelterbelt Renovation (650)		●	●		○	●	○	○	○	○		●										
Direct Affect	●	Stand-alone Practice												■								
Probable Affect	○	Part of Program or Other Requirements												□								
Negative Affect	▲																					

Table VIII-4 - Livestock

	Practices for Agricultural Lands - Livestock																				
	Concern	Algal Blooms	Aquatic Habitat	Fecal Coliforms	Pesticide Run-off	Nutrient Run-off	Metal Content	Sedimentation	Stormwater	Turbidity	Water Temperature	Wildlife Habitat	Program	BCWP	American Farmland Trust	I-DNR - Fish & Wildlife	I-DNR - Lake and River Enhancement	NRCS - CRP	NRCS - EQIP	NRCS - WHIP	Conservation Organizations (QU, DU, Soil & Water Conservation District
Best Management Practice																					
Access Control / Use Exclusion (472)	11	●	●	●		●	○					●							■	■	
Alley Cropping (311)	8	○	○		○	○		○	○	○		○									
Anaerobic Digester (365/366)	5	●	○			●													■		
Animal Mortality Facility (316)	3	○	○			○													■		
Composting Facility (317)	3	○	○			○													■		
Critical Area Planting (342)	9	○	○			○	○	●		●		○						■	■		
Early Successional Habitat Development (647)	3		●								▲	●				□			■	■	□
Field Border (386)	10	○	○		○	○	○	○	○	○		●				□			■	■	□
Forage Harvest Management (511)	9	○	○		○	○	○	○	○	○		○									
Heavy Use Area Protection (561)	4	○				○		○		○									■		
Hedgerow Planting (422)	7	○	○		○	○					○	●				□				■	□
Nutrient Management (590)	7	●	○			●	●								■				■		
Pasture and Hayland Planting (512)	10	○	○		○	○	○	○	○	○		●							■		
Pest Management (595)	7		●		●			○				●							■	■	
Pond (378)	10	○	●			○	○	○		●		●							□		
Prescribed Burning (338)	7	○	○			○		○	○	○		●									□
Prescribed Grazing (528)	16	●	●	○	●	●	○	○	○	●		●							■		
Run-off Management System (570)	3							○	○	○											
Spring Development (574)	5		○				○		○	○		○				□			■	■	□
Stream Crossing (578)	-1	▲		▲		▲		○		○									■		
Upland Wildlife Habitat Management (645)	8		●					○	●	○		●				□			■	■	□
Waste Storage Facility (313)	5	●		○		●													□		
Watering Facility (614)	6		○				○		○	○	○	○							■		
Windbreak - Shelterbelt Establishment (380)	11	○	●		○	○	○	○	○	○		●				□		■	■	■	□
Windbreak - Shelterbelt Renovation (650)		●	●		○	●	○	○	○	○		●									

Direct Affect	●
Probable Affect	○
Negative Affect	▲
Stand-alone Practice	■
Part of Program or Other Requirements	□

Table VIII-5 – Streams and Wetlands

	Practices for Streams & Wetlands													Program	BCWP	American Farmland Trust	I-DNR - Fish & Wildlife	I-DNR - Lake and River Enhancement	NRCS - CRP	NRCS - EQIP	NRCS - WHIP	Conservation Organizations (OU, DU, District)	Soil & Water Conservation District
	Concern	Algal Blooms	Aquatic Habitat	Fecal Coliforms	Pesticide Run-off	Nutrient Run-off	Metal Content	Sedimentation	Stormwater	Turbidity	Water Temperature	Wildlife Habitat											
Best Management Practice																							
Access Control / Use Exclusion (472)	11	●	●	●		●	○					●				■	■						
Conservation Cover (327)	13	○	○		●	○	○	●	○	●		●			□			□					
Constructed Wetland (656)	18	●	●	●	○	●	○	●	●	●		●											
Critical Area Planting (342)	9	○	○			○	○	●		●		○				■							
Drainage Water Management (554)	6	○	○		○	○	○		○		▲	○				■							
Early Successional Habitat Development (647)	3		●								▲	●			□		■	■	□				
Field Border (386)	10	○	○		○	○	○	○	○	○		●			□		■	■	□				
Filter Strip (393)	15	●	●		●	●	●	●		●		○				■	■						
Grassed Waterway (412)	10	○	○		○	○	○	○	●	○		○				■							
Pond (378)	10	○	●			○	○	○		●		●					□						
Prescribed Burning (338)	7	○	○			○		○	○	○		●			□				□				
Prescribed Forestry (409)	17	●	●		○	●	○	●	○	●	●	●			□								
Restoration & Management of Declining Habitat (643)	6		●									○	●		□		■	■	□				
Riparian Forest Buffer (391)	19	●	●		●	●	○	●	●	●	●	●			□		■	■	■	□			
Riparian Herbaceous Cover (390)	17	●	●		○	●	○	●	●	●	○	●			□		□	■	■	□			
Sediment Basin (350)	11	●	○		○	●	○	●	○	●		▲					□						
Shallow Water Development & Management (646)	11	○	●			○	○	○	○	○		●			□		■	■	■	□			
Spring Development (574)	5		○				○		○	○		○					■	■					
Stream Channel Stabilization (584)	5		○					○		○	○	○											
Stream Crossing (578)	-1	▲		▲		▲		○		○							■						
Stream Habitat Improvement & Management (395)	8		●							●	●	●											
Streambank & Shoreline Protection	9	○	○			○		●		●	○	○											
Structure for Water Control (587)	4							○	○	○	○						□						
Tree & Shrub Establishment (612)	15	○	●		●	○	○		○	●	○	●			□		■	□	□	□			
Upland Wildlife Habitat Management (645)	8		●					○	●	○		●			□			■	■	□			
Water & Sediment Control Basin (638)	8	○			○	○	○	●	○	●	▲						□						
Wetland Creation (658)	14	●	●		○	●	○	○	●	○		●			□		□		■	□			
Wetland Enhancement (659)	14	●	●		○	●	○	○	●	○		●			□	□			■	□			
Wetland Restoration (657)	14	●	●		○	●	○	○	●	○		●			□	□	■	■	■	□			
Wetland Wildlife Habitat Management (644)	8		●						●	○		●			□			■	■	□			

Direct Affect	●
Probable Affect	○
Negative Affect	▲
Stand-alone Practice	■
Part of Program or Other Requirements	□

Table VIII-6 – Forested and Upland

Practices for Upland & Forest																
	Concern	Algal Blooms	Aquatic Habitat	Fecal Coliforms	Pesticide Run-off	Nutrient Run-off	Metal Content	Sedimentation	Stormwater	Turbidity	Water Temperature	Wildlife Habitat	Program	BCWP	American Farmland Trust	LDNR - Fish & Wildlife, Forestry
Best Management Practice																
Access Control / Use Exclusion (472)	11	●	●	●		●	○					●				□
Conservation Cover (327)	13	○	○		●	○	○	●	○	●		●			□	□
Critical Area Planting (342)	9	○	○			○	○	●		●		○				■
Early Successional Habitat Development (647)	3		●								▲	●			□	■
Field Border (386)	10	○	○		○	○	○	○	○	○		●			□	■
Forest Stand Improvement (666)	9	●			○	●	○		●		▲	●			□	□
Hedgerow Planting (422)	7	○	○		○	○					○	●			□	■
Pasture and Hayland Planting (512)	10	○	○		○	○	○	○	○	○		●				■
Prescribed Burning (338)	7	○	○			○		○	○	○		●			□	□
Prescribed Forestry (409)	17	●	●		○	●	○	●	○	●	●	●			□	□
Prescribed Grazing (528)	16	●	●	○	●	●	○	○	○	●		●				■
Recreation Area Improvement (562)	7		○					●	○	●		○				
Recreation Land Grading and Shaping (566)	0		▲						○	○		▲				
Recreation Trail and Walkway (568)	1		▲					○	○	○		▲				
Restoration & Management of Declining Habitat (643)	6		●								○	●			□	■
Riparian Forest Buffer (391)	19	●	●		●	●	○	●	●	●	●	●			□	■
Shallow Water Development & Management (646)	11	○	●			○	○	○	●	○		●			□	■
Spring Development (574)	5		○				○		○	○		○				■
Tree & Shrub Establishment (612)	15	○	●		●	○	○		○	●	○	●			□	■
Upland Wildlife Habitat Management (645)	8		●					○	●	○		●			□	■
Windbreak - Shelterbelt Establishment (380)	11	○	●		○	●	○	○	○	○		●			□	■
Windbreak - Shelterbelt Renovation (650)		●	●		○	●	○	○	○	○		●				■

Direct Affect	●
Probable Affect	○
Negative Affect	▲
Stand-alone Practice	■
Part of Program or Other Requirements	□

8.03 Logistics

The Busseron Creek Watershed Management Plan is a planning level document that will help target program resources over the planning horizon of the BCWP, 15 years. The BCWP and Sullivan County Soil & Water Conservation District will take the lead role in the implementation phase of the plan and tracking success.

Other watershed analysis and planning efforts will be incorporated into the implementation phase, including the Sullivan County Park and Lake Sedimentation and Nutrient Reduction plan.

(a) Scheduling / Phasing

Limiting factors can be attributed to:

- A) landowner participation
- B) funding availability

To overcome these limitations, a plan of work will be devised and updated annually along with this watershed management plan. The plan of work, similar to those used by SWCDs will outline tasks and timelines to be accomplished during the year and forecast those tasks to be accomplished in the following 2 years.

Participants in the program will be enrolled through development of a whole-tract conservation plan, similar to those developed by the NRCS. Ranking based upon priorities listed in Objective / Goal / Task and overall BMP effectiveness will determine priority should funds be limited.

(b) Financial Assistance Needed

Many of the management plan strategies are costly, require additional staff time and are presently beyond the existing capacity of the BCWP or other key parties. To meet the goals of the BCWP, several parties may need to seed additional program funds or additional staff. For the BCWP capacity, pooled resources of other watersheds / watershed groups such as The Partnership for Turtle Creek can provide some of those needed funds. In addition, cooperative agreements between the Sullivan County SWCD and the Natural Resources Conservation Service can provide technical training, tools, and staff funding.

Because many programs or grants are based upon land use, concerns, objectives, and tasks have been organized by land use. Where possible, funding opportunities have been identified for individual BMPs (Section 8.03).

As indicated in the tasks associated with Goal 11, financial planning, capacity planning / building are an integral component to the success of the BCWP.

(c) Existing Programs

Implementation of this plan is not intended to be a stand-alone program. It is part of a over-arching strategy to improve the surface water quality – and overall environmental quality of the Busseron Creek Watershed.

It is the intent of the BCWP to utilize Section 319 funds to leverage existing and planned programs and to narrow gaps between those programs. Available practice funding and programs are listed in Section 8.03.

(d) Technical resources

(i) Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways

Source: US Forest Service / NRCS

(ii) Best Practices in Abandoned Mine Land Reclamation

Source: Colorado Division of Minerals and Geology

(iii) Farm Management Practices for Reclaimed Cropland

Source: Indiana Soils / Prime Farmland Team

(iv) Field Office Technical Guide (FOTG)

Source: NRCS

(v) Guide to Creating Vernal Wetlands

Source: US Forest Service, Ducks Unlimited, and the Izaak Walton League

(vi) Green Infrastructure – Linking Landscapes and Communities

Source: The Conservation Fund

Section IX. Monitoring

Throughout the implementation process, several indicators will be used to determine if water quality improvements have been attained. These indicators have been identified as “Success / Performance Measure” in the table comprising 7.02 - *Task Implementation and Indicators* and have been classified as Social, Environmental, or Administrative.

9.01 Social Indicators

Social Indicators complement other environmental and administrative indicators to present a complete picture of project and management strategy effectiveness. They provide information about awareness, attitudes, capacity, and behaviors that are expected to lead to water quality improvement and protection. Social Indicators will be used to monitor:

- Increased awareness of watershed activities, concerns, and accomplishments
- Increase knowledge of and concern for watershed issues
- Increase knowledge of conservation land practices and their importance to watershed health
- Improved attitudes towards actions to improve watershed health
- Increased participation in activities for the watershed
- Participation in cost-share programs

Monitoring of Social Indicators will be accomplished through tracking of attendance at workshops, distribution of information / educational flyers, and participation in watershed programs.

By monitoring Social Indicator statistics, the Steering Committee will be able to identify whether or not stakeholders are becoming more involved in watershed activities.

9.02 Environmental Indicators

Environmental Indicators are measurements of water quality, habitat or other criteria that provide information about watershed health. They provide accurate progress of changes in water quality. Examples include chemical and biological monitoring of pollutant loads, species population / health, and habitat assessments. Environmental Indicators will be used to measure:

- Changes in pollutant loads in surface waters.
- Changes in macroinvertebrate populations
- Changes in habitat quality.

Indicators will be monitored at minimum through a quarterly water testing, annual macroinvertebrate sampling, and annual CQHEI assessments at existing BCWP sampling locations. In addition, annual (at minimum) before and after analysis of water and/or habitat quality will be performed at critical points throughout the watershed.

By monitoring Environmental Indicator statistics, the Steering Committee will be able to evaluate the effectiveness of BMP implementation programs.

9.03 Administrative Indicators

Administrative Indicators are statistics that can provide tracking information regarding program participation, task completion, and objective attainment. Examples of indicators include number of attendees at workshops, lineal foot or acreage of implemented BMPs, and change in the number of stakeholders participating in cost-share programs. These indicators are useful to track increased participation in programs, but can also be used to calculate expected pollutant load reductions. Administrative Indicators will be used to measure:

- Attendance at workshops and field days
- Number of conservation practices installed
- Adoption or changes of local governmental guidelines
- Volume of educational materials distributed
- Use of media (newspaper, radio, website) for distribution of information

By monitoring Administrative Indicators, the Steering Committee will be able to identify trends for use in planning of future activities to promote the most interest and highest level of positive impact from education, promotional and cost-share programs.

9.04 Monitoring Plan

A database tracking system will be developed and maintained to record social, environmental, and administrative indicators. The database will be updated after workshops / events and sampling events, and it will be updated quarterly for non-time-specific measures such as requests for education materials.

Information regarding participation in conservation programs will be reviewed by the Steering Committee on no less than a quarterly basis. Other information will be reviewed and discussed by the Steering Committee on no less than an annual basis.

This information will be used Evaluate, Adapt, and Amend this Watershed Management Plan (*Section XI*)

Section X. *Plan Evaluation, Adaptation, and Amendment*

This watershed management plan is not intended to be a static document. It will be reviewed on an annual basis to:

- Review and Update Concerns, Sources, and Critical Areas
- Create Annual Work Plans
- Target potential funding sources
- Document Progress

The review and adaptation process may be scheduled to coincide with grant funding cycles, planning processes of major community organizations, and planning processes for local government agencies.

This plan may be adapted or blended with other watershed management plans to effect larger-scale change and capitalize on shared resources.

The ultimate goal of this watershed management plan is to promote improved environmental stewardship and the long-term sustainability of the Busseron Creek Watershed Partnership.

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